NATacoustic
Acoustic Calibration & Testing Laboratory
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A division of Renzo Tonin & Associates (NSW) Pty Ltd ABN 29 117 462 861

Certificate of Calibration
Sound Level Meter

Calibration Date	13/10/2014	**Job No**	RB304	**Operator**	SD
Client Name	RENZO TONIN & ASSOCIATES (NSW) PTY LTD				
Client Address	LEVEL 1 418A ELIZABETH ST SURRY HILLS 2010				

Test Item

Instrument Make	NTI	**Model**	XL2	**Serial No**	A2A-05710-E0
Microphone Make	GRAS	**Model**	40AE	**Serial No**	158340
Preamplifier Make	NTI	**Model**	MA220	**Serial No**	002619
Ext'n Cable Make	NTI	**Model**	N/A	**Serial No**	N/A
Accessories	Nil	**Firmware**	2.60		

SLM Type	1
Filters Class	1

Environmental Conditions	**Measured**	
	Start	**End**
Air Temp. (°C)	24.4	23.9
Rel. Humidity (%)	52.7	47.3
Air Pressure (kPa)	100.2	99.9

Applicable Standards:
Periodic tests were performed in accordance with procedures from IEC 61672-3 :2013

Applicable Work Instruction:
RWi-08 SLM & Calibrator Verification

Laboratory Equipment :
B&K2636 Measuring Amplifier SN 1135806
B&K4226 Multifunction Acoustic Calibrator SN 2288472
Agilent Function Generator Model 33220A SN MY43004013
Agilent Digital Multimeter Model 34401A SN MY41004386

Traceability:
Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. This document shall not be reproduced, except in full.

Scope:
This certificate is issued on the basis that the instrument complies with the manufacturer's specification. See "Sound Level Meter Verification - Summary of Tests" page for an itemised list of results for each test.

Uncertainty:
The uncertainty is stated at a confidence level of 95% using a k factor of 2.

Calibration Statement:
The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organization responsible for approving the results of pattern evaluation tests performed in accordance with AS IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in AS IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 specifications of AS IEC 61672-1:2013.

NATA
WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory Number 14966

Authorized Signatory:

Print Name: Renzo Tonin Date: 13 Oct 2014

Template Document Name: RQT-05 (rev 28) SLM ISO Verification

NATacoustic
Sound Level Meter Verification - Summary of Tests

Calibration Date	13/10/2014	**Job No**	RB304	**Operator**	SD
Client Name	RENZO TONIN & ASSOCIATES (NSW) PTY LTD				
Client Address	LEVEL 1 418A ELIZABETH ST SURRY HILLS 2010				

1. Instrument Information & Reference Conditions

Instrument Make	NTI	**Model**	XL2	**Serial No**	A2A-05710-E0
Microphone Make	GRAS	**Model**	40AE	**Serial No**	158340
Preamplifier Make	NTI	**Model**	MA220	**Serial No**	002619
Ext'n Cable Make	NTI	**Model**	N/A	**Serial No**	N/A
Accessories	Nil	**Firmware**	2.60		

Freq Weightings	**FLAT**	No	**A**	Yes	**C**	Yes	**Z**	Yes
Time Weightings	**Fast**	Yes	**Slow**	Yes	**Impulse**	Yes		

SLM Type	1
Filter Class	1

Instruction Manual is Available	Yes

2. Preliminary Inspection and Power Supply		
	Logger Inspected	Yes
	Calibration Equipment Okay	Yes
	Power Supply Ok (Start)	Yes
	Power Supply Ok (End)	Yes

3. Environmental Conditions	**Environmental Conditions**	**Measured**	
		Start	**End**
	Air Temp. (°C)	24.4	23.9
	Rel. Humidity (%)	52.7	47.3
	Air Pressure (kPa)	100.2	99.9
	Conforming	Yes	Yes

Test Description			**Value / Conforming**	**Uncert (+/-)**
4(a). Initial Calibration		**Calibration Frequency Hz**	1000.0	N/A
		Indicated Level Before Adjustment (dB)	93.9	0.11
		Indicated Level After Adjustment (dB)	94.0	0.11
		Stability During Continuous Operation (dB)	Yes	N/A
5(a). Self-Generated Noise, Microphone Installed		**A**	15.9	0.09
5(b). Self-Generated Noise, Electrical		**A**	7.8	0.09
		C	11.3	0.09
		Z	17.3	0.09
6. Acoustical Signal Test		**125 Hz**	Yes	0.42
		1 kHz	Yes	0.42
		8 kHz	Yes	0.60
7. Electrical Frequency Weighting		**A**	Yes	0.09
		C	Yes	0.09
		Z	Yes	0.09
8. Frequency & Time Weightings 1kHz	**8(a). Frequency Weighting**	**C**	Yes	0.09
		Z	Yes	0.09
		FLAT	N/A	0.09
	8(b). Time Weighting	**Slow**	Yes	0.09
		Leq	Yes	0.09
9(a). Level Linearity 8kHz (Increasing)		**Conforming**	Yes	0.13
9(b). Level Linearity 8kHz (Decreasing)		**Conforming**	Yes	0.13
10(a). Level Linearity Including the Level Range (Reference Signal)		**Conforming**	Yes	0.13
10(b). Level Linearity Including the Level range (5dB Above Under-range)		**Conforming**	Yes	0.13
11. Toneburst Response		**Fast**	Yes	0.13
		Slow	Yes	0.13
		SEL/Leq	Yes	0.13
12. Peak C sound level		**8 kHz**	Yes	0.09
		500 Hz	Yes	0.09
13. Overload indication		**Conforming**	Yes	0.09
		Latches	N/A	N/A
14. High-level Stability		**Conforming**	Yes	0.09
15(a). Octave Band Filter		**4 Hz**	N/A	0.09
		8 Hz	Yes	0.09
		16 Hz	Yes	0.09
		31.5 Hz	Yes	0.09
		63 Hz	Yes	0.09
		125 Hz	Yes	0.09
		250 Hz	Yes	0.09
		500 Hz	Yes	0.09
		1 kHz	Yes	0.09
		2 kHz	Yes	0.09
15(b). Octave Band Filter		**4 kHz**	Yes	0.09
		8 kHz	Yes	0.09
		16 kHz	Yes	0.09
		32 kHz	N/A	0.09
16(a). Third Octave Band Filter		**4Hz**	N/A	0.09
		5Hz	N/A	0.09
		6.3Hz	Yes	0.09
		8Hz	Yes	0.09
		10Hz	Yes	0.09
		12.5Hz	Yes	0.09
		16Hz	Yes	0.09
		20Hz	Yes	0.09
		25Hz	Yes	0.09
		31.5Hz	Yes	0.09
16(b). Third Octave Band Filter		**40Hz**	Yes	0.09
		50Hz	Yes	0.09
		63Hz	Yes	0.09

	80Hz	Yes	0.09
	100Hz	Yes	0.09
	125Hz	Yes	0.09
	160Hz	Yes	0.09
	200Hz	Yes	0.09
	250Hz	Yes	0.09
	315Hz	Yes	0.09
16(c). Third Octave Band Filter	**400Hz**	Yes	0.09
	500Hz	Yes	0.09
	630Hz	Yes	0.09
	800Hz	Yes	0.09
	1kHz	Yes	0.09
	1.25kHz	Yes	0.09
	1.6kHz	Yes	0.09
	2kHz	Yes	0.09
	2.5kHz	Yes	0.09
	3.15kHz	Yes	0.09
16(d). Third Octave Band Filter	**4kHz**	Yes	0.09
	5kHz	Yes	0.09
	6.3kHz	Yes	0.09
	8kHz	Yes	0.09
	10kHz	Yes	0.09
	12.5kHz	Yes	0.09
	16kHz	Yes	0.09
	20kHz	Yes	0.09
	25kHz	N/A	0.09
	31.5kHz	N/A	0.09

SLM Overall Conforming	**Yes**

The calibration of all instruments used in these tests is traceable to Australian Physical Standards held by the National Measurement Institute, Sydney, Australia.

Procedures from IEC 61672-3:2006 were used to perform the tests.

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Template Document Name: RQT-05 (rev 28) SLM ISO Verification

1(a). Instrument Information

Calibration Date	13/10/2014	Job No	RB304	Operator	SD

Client Name	RENZO TONIN & ASSOCIATES (NSW) PTY LTD
Client Address	LEVEL 1 418A ELIZABETH ST SURRY HILLS 2010

1. Instrument Information

Instrument Make	NTI	Model	XL2	Serial	A2A-05710-E0		
Microphone Make	GRAS	Model	40AE	Serial	158340	pF	15
Preampifier Make	NTI	Model	MA220	Serial	002619		
Ext'n Cable Make	NTI	Model	N/A	Serial	N/A		
Accessories	Nil			Firmware	2.60		

Freq Weightings		
	A	Yes
	C	Yes
	Z	Yes
	FLAT	No

Time Weightings		
	Fast	Yes
	Slow	Yes
	Impulse	Yes

Functions		
	Leq	Yes
	SEL	Yes
	Peak	Yes

Instrument Ranges	Range Name	Indicator Range		Primary Range	
		Low dB	High dB	Low dB	High dB
1	HIGH	40	140	60	140
2	MID	20	120	40	120
3	LOW	0	100	20	100
4					
5					
6					
7					
8					
9					
10					
Check List	OK				

Reference Range	MID
Ref. SPL @ 1kHz	94

Linearity Limits on Ref range	Low dB	High dB
1kHz Leq (A weighting)	40.0	120.0
4kHz Leq	40.0	120.0
8kHz Leq	40.0	120.0

Highest Range for 10(b),12,13	MID

SLM Class	1
Filter Class	1
Filter Base	2

Colour Legend	
Enter Value	110
Operator Action	110
Difference	1.0
Error/Outside Tolerance	2.0
Tolerance	+/-1
Select Toggle	Val
Informative	110
Conforming	Yes

Instruction Manual Title (Clause 3.1&3.2, IEC 61672-3:2013)	NTI XL2 Operating Manual
Version	2.5
Publication Date	2/11/2012
Source of Document (& Date of Download if Applicable)	N/A

Conforming	Yes

Pattern Evaluation Test Report (Clause 3.5, IEC 61672-3:2013)	Type Approval Certificate
Reference Number or Page Number	PTB-1.53-4058763
Publication Date	14/01.2013
Source of Document (& Date of Download if Applicable)	N/A

Conforming	Yes

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1(b). Acoustic Corrections

	Absolute Corrections and Uncertainties									
Freq	Mic FF to Pressure		Case		Windscreen		Other *		Total	
(Hz)	dB	Uncert dB	dB	Uncert dB	dB	Uncert dB	dB	Uncert dB	dB	Uncert dB
31.5	0.00								0.00	0.41
63	0.00								0.00	0.41
125	0.00								0.00	0.41
250	0.00								0.00	0.41
500	0.00								0.00	0.41
1k	0.20								0.20	0.41
2k	0.45								0.45	0.41
4k	1.05								1.05	0.41
8k	3.20								3.20	0.58
12.5k	5.60								5.60	0.64
16k	7.10								7.10	0.64

Source of Mic FF to Pressure Correction	Interpolated from GRAS Calibration Curve
Source of Case Correction	N/A
Source of Windscreen Correction	N/A
***Description of Other Correction**	N/A

Descriptions of Tests

1(b). Acoustical signal tests of a frequency weighting (IEC 61672-3)
(Clause 12.2)
Correction data shall account for:
- the equivalent free-field or random-incidence frequency response of the sound level meter if the source of sound or simulated sound is the pressure field in a multi-frequency sound calibrator, in a comparison coupler, or from an electrostatic actuator; and,
- if applicable, the average influence on the frequency response of a typical microphone of a windscreen and any accessories that are part of the configuration of the sound level meter for normal use.

(Clause 12.3)
Correction data shall be obtained from tables in the Instruction Manual for the sound level meter.
(Clause 12.4)
If the necessary correction data are not available from the Instruction Manual, data from the manufacturer of the microphone, multi-frequency sound calibrator, comparison coupler, or electrostatic actuator may then be used. This data shall be publicly available
(Clause 12.5)
The source for the free-field or random-incidence correction data shall be stated in the documentation for the results of the periodic tests. The source for the associated uncertainties of measurement shall be the same as the source for the corresponding correction data. If the uncertainties of the corresponding free-field correction data are not available, the applicable maximum-permitted uncertainties given in IEC 62585 shall be used in the calculation of the laboratory's total uncertainty budget.

NOTE: Where the uncertainties due to the "Mic FF to Pressure", "Case" or "Windscreen" are omitted in the table above, the following statement applies:

No information on the uncertainty of measurement, required by IEC 61672-3:2013, for the correction data given in the Instruction Manual or obtained from the manufacturer or supplier of the sound level meter, or the manufacturer of the microphone, or the manufacturer of the multi-frequency sound calibrator was provided in the Instruction Manual or made available by the manufacturer or supplier of the sound level meter. The uncertainty of measurement of the correction data was therefore assumed to be the maximum-permitted uncertainty given in IEC 62585 for the corresponding free-field correction data and for a coverage probability of 95 %.

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1(c). Electrical Corrections

	Absolute Corrections and Uncertainties									
Freq	Mic 0 deg FF Resp		Case		Windscreen		Other *		Total	
(Hz)	dB	Uncert dB	dB	Uncert dB	dB	Uncert dB	dB	Uncert dB	dB	Uncert dB
31.5	0.00		0.00		0.00		0.00		0.00	0.41
63	0.00		0.00		0.00		0.00		0.00	0.41
125	0.00		0.00		0.00		0.00		0.00	0.41
250	0.00		0.00		0.00		0.00		0.00	0.41
500	0.00		0.00		0.00		0.00		0.00	0.41
1k	0.05		0.00		0.00		0.00		0.05	0.41
2k	0.10		0.00		0.00		0.00		0.10	0.41
4k	0.00		0.00		0.00		0.00		0.00	0.41
8k	0.30		0.00		0.00		0.00		0.30	0.58
12.5k	0.56		0.00		0.00		0.00		0.56	0.64
16k	0.77		0.00		0.00		0.00		0.77	0.64

Source of Mic 0 deg Free-field Response	Interpolated from GRAS Calibration Curve
Source of Case Correction	N/A
Source of Windscreen Correction	N/A
*Description of Other Correction	N/A

Descriptions of Tests

1(c). Acoustical signal tests of a frequency weighting (IEC 61672-3)
(Clause 13.6)
For each frequency weighting and at each test frequency, corrections shall be applied to the relative frequency weightings determined in 13.5 to account for:
– the deviation of the free-field or random-incidence frequency response of the microphone in the reference direction from a uniform frequency response;
– the average effects of reflections from the case of the sound level meter and of diffraction of sound around the microphone and preamplifier; and,
– if applicable, the average influence on the frequency response of a typical microphone of a windscreen and any accessories that are part of the configuration of the sound level meter for normal use.
(Clause 13.7)
Corrections for the effects of reflections and diffraction and for the influence of the windscreen and windscreen accessories on the free-field or random-incidence frequency response shall be the same as used for the frequency-weighting tests with acoustical signals.

NOTE: Where the uncertainties due to the "Mic FF to Pressure", "Case" or "Windscreen" are omitted in the table above, the following statement applies:

No information on the uncertainty of measurement, required by IEC 61672-3:2013, for the correction data given in the Instruction Manual or obtained from the manufacturer or supplier of the sound level meter, or the manufacturer of the microphone, or the manufacturer of the multi-frequency sound calibrator was provided in the Instruction Manual or made available by the manufacturer or supplier of the sound level meter. The uncertainty of measurement of the correction data was therefore assumed to be the maximum-permitted uncertainty given in IEC 62585 for the corresponding free-field correction data and for a coverage probability of 95 %.

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2. Preliminary,3.Environmental Conditions & 4. Calibration

2. Preliminary Inspection and Power Supply

Instrument Inspected	Yes
Laboratory Calibration Equipment Ok	Yes
Power Supply Ok (Start)	Yes
Power Supply Ok (End)	Yes

3. Environmental Conditions

Environmental Conditions	Measured		Uncert.	Limits	
	Start	End		Min	Max
Air Temp. (°C)	24.4	23.9	1.11	20	26
Rel. Humidity (%)	52.7	47.3	5.64	25	70
Air Pressure (kPa)	100.2	99.9	2.06	80	105
Conforming	Yes	Yes			

4(a). Initial Calibration

SLM Settings	
Time Weighting	Fast
Frequency Weighting	Z
SLM Range	MID
Microphone / Windshield Correction	OFF
Polarization Voltage (V)	0
Microphone Sensitivity (mV/Pa)	47.4

B&K 4226 Calibrator Settings	
"Sound Field"	Pressure
"Microphone"	N/A
Calibration Level (Lin)	94
Calibration Frequency (Hz)	1000

Calibration	
Indicated Level before adjust. (dB)	93.9
Adjustment required	Yes
Indicated level after adjust. (dB)	94

4(b). Final Calibration

Level at conclusion of testing (dB)	94.1
Difference	0.1
Tolerance	± 0.1
Conforming	Yes
Uncertainty (+/-) dB	0.11

Descriptions of Tests

2. Preliminary Inspection and Power Supply (IEC 61672-3 Clause 5 "Preliminary Inspection" & Clause 6 "Power Supply")
Prior to any measurements, the sound level meter and all accessories shall be visually inspected, paying particular attention to damage to, or accumulation of foreign material on, the protection grid or diaphragm of the microphone. All relevant controls shall be operated to ensure that they are in working order. If the controls, display, and other essential elements are not in proper working order, no periodic tests shall be performed.

For all tests, the sound level meter shall be powered from its preferred supply or a suitable alternative. Before and after conducting the set of tests with acoustical signals and before and after conducting the set of tests with electrical signals, the power supply for the sound level meter shall be checked by the method stated in the Instruction Manual to ensure that it is within the specified operating limits. If the voltage or the equivalent indication of the status of the power supply is not within the operating limits and the reason cannot be attributed to partially discharged batteries or an incorrect selection of the voltage of the public power supply, then no periodic tests shall be performed as a malfunction is indicated.

3. Environmental conditions (IEC 61672-3 Clause 7 "Environmental Conditions")
Periodic tests shall be performed within the following ranges of environmental conditions: 80 kPa to 105 kPa for static air pressure, 20 °C to 26 °C for air temperature and 25 % to 70 % for relative humidity. These conditions are recorded at the start and end of the testing.

4a. Calibration (IEC 61672-3 Clause 10 "Indication at the calibration check frequency")
The sound level meter shall be adjusted, if necessary, to indicate the required sound level for the environmental conditions under which the tests are performed. The indications of the sound level meter before and after adjustment shall be recorded.

4b. Long-term Stability (IEC 61672-3 Clause 15)
The long-term stability of a sound level meter is evaluated from the difference between the A-weighted sound levels indicated in response to steady 1 kHz signals applied at the beginning and end of a period of operation. For each indication, the level of the input signal shall be that which is required to display the reference sound pressure level on the reference level range for the first indication.

The period of continuous operation shall be between 25 min and 35 min during which any convenient set of tests that use electrical input signals are performed.

The measured difference between the initial and final indications of A-weighted sound level shall not exceed the acceptance limits given in IEC 61672-1.

☑ Checked

5. Self-Generated Noise

5(a). Self-Generated Noise, Microphone Installed

SLM Settings	
Time Weighting	Fast
Frequency Weighting	A
SLM Range	LOW
Measurement Function	Leq
Integration time (s)	30

Results		
Freq Wt	Observed	Quoted
A	15.9	16.6

Uncertainty (+/-) dB	0.09

Observed Values		
Leq	N/A	
15.9	1	
	2	
	3	
	4	
	5	
	6	
	7	
	8	
	9	
	10	
	Avg	

5(b). Self-Generated Noise, Electrical

SLM Settings	
Time Weighting	Fast
SLM Range	LOW
Measurement Function	Leq
Integration time (s)	30

Observed Values		
Leq		
A	C	Z
7.8	11.3	17.3

Results		
Freq Wt	Observed	Quoted
A	7.8	12.4
C	11.3	13.5
Z	17.3	18.3-25.5

Uncertainty (+/-) dB	0.09

N/A			
Obs	A	C	Z
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
Avg			

Descriptions of Tests

5(a) Self-Generated Noise, Microphone Installed (IEC 61672-3 Clause 11.1)
Measurements of the level of self-generated noise shall be made in a location that is available to the testing laboratory and where the level of background noise is minimized. Any supplied windscreen and windscreen accessory need not be installed around the microphone for measurement of the level of self-generated noise. The sound level meter shall be in the configuration submitted for periodic testing and with the most-sensitive level range and frequency-weighting A selected.

The indicated level of the A-weighted self-generated noise on the most-sensitive level range shall be recorded and reported. The level of self-generated noise is preferably measured as a time-averaged sound level with an averaging time of at least 30 s. Time-averaged sound level may be measured directly or calculated from an indication of sound exposure level and integration time. If time-averaged sound level cannot be determined, the time-weighted sound level from the average of ten observations taken at random over a 60 s interval shall be measured. If the time-weighted sound level is recorded, the S time weighting shall be used if available; otherwise the F time weighting shall be used.

5(b) Self-Generated Noise - Electrical (IEC 61672-3 Clause 11.2)
With the microphone replaced by the electrical input-signal device (or using the specified means of inserting electrical signals), and with the device terminated in the manner specified in the Instruction Manual for measurements of the level of self-generated noise, the indicated level of the time-averaged or time-weighted self-generated noise, measured by the same procedure as with the microphone installed, shall be recorded and reported for all frequency weightings and for the most-sensitive level range.

☑ Checked

6. Acoustical Signal Test

SLM Settings	
Time Weighting	Fast
Frequency Weighting	C
SLM Range	MID
Microphone Compensation Filter	OFF
B&K 4226 Calibrator Settings	
"Sound Field"	Pressure
"Microphone"	N/A
Reference Setting (Lin)	94

Freq	Observed Values			Mean Meter Reading	4226 calibrator corrections	Corrected Mean Readings	Pressure to Free Field	Case Effect Correction	Windscreen Effect Correction	Other Effect Correction	Equivalent Free Field	Response re 1kHz	C Weighting Response	Deviation from Expected	Tolerance		Conforming	Uncertainty		
																		Total	Lab	Corrections
(Hz)	Set 1	Set 2	Set 3												Type 1	Type 2		(+/-) dB	(+/-) dB	(+/-) dB
31.5	90.9	90.9	90.9	90.90	-0.03	90.87	0.00	0.00	0.00	0.00	90.87	-3.30	-3.00	-0.30	± 1.5	± 3.0	Yes	0.43	0.14	0.41
63	93.2	93.2	93.2	93.20	-0.07	93.13	0.00	0.00	0.00	0.00	93.13	-1.04	-0.80	-0.24	± 1.0	± 2.0	Yes	0.42	0.12	0.41
125	93.9	93.9	93.9	93.90	-0.05	93.85	0.00	0.00	0.00	0.00	93.85	-0.32	-0.20	-0.12	± 1.0	± 1.5	Yes	0.42	0.12	0.41
250	94.1	94.1	94.1	94.10	-0.04	94.06	0.00	0.00	0.00	0.00	94.06	-0.11	0.00	-0.11	± 1.0	± 1.5	Yes	0.42	0.12	0.41
500	94.1	94.1	94.1	94.10	-0.03	94.07	0.00	0.00	0.00	0.00	94.07	-0.10	0.00	-0.10	± 1.0	± 1.5	Yes	0.42	0.12	0.41
1k	**94.0**	**94.0**	**94.0**	**94.00**	**-0.03**	**93.97**	**0.20**	**0.00**	**0.00**	**0.00**	**94.17**	**0.00**	**0.00**	0.00	± 0.7	± 1.0	Yes	0.42	0.11	0.41
2k	93.7	93.7	93.7	93.70	-0.01	93.69	0.45	0.00	0.00	0.00	94.14	-0.03	-0.20	0.17	± 1.0	± 2.0	Yes	0.43	0.13	0.41
4k	92.6	92.6	92.6	92.60	-0.01	92.59	1.05	0.00	0.00	0.00	93.64	-0.53	-0.80	0.27	± 1.0	± 3.0	Yes	0.43	0.14	0.41
8k	89.4	89.4	89.4	89.40	-0.07	89.33	3.20	0.00	0.00	0.00	92.53	-1.64	-3.00	1.36	+1.5; -2.5	± 5.0	Yes	0.60	0.15	0.58
12.5k	84.2	84.2	84.2	84.20	-0.10	84.10	5.60	0.00	0.00	0.00	89.70	-4.47	-6.20	1.73	+2.0; -5.0	+5,-inf	Yes	0.68	0.21	0.64
16k	79.6	79.6	79.6	79.60	-0.07	79.53	7.10	0.00	0.00	0.00	86.63	-7.54	-8.50	0.96	+2.5; -16.0	+5,-inf	Yes	0.74	0.37	0.64

Description of Tests

6. Acoustical signal tests of a frequency weighting (IEC 61672-3 Clause 12)

The sound level meter shall be set for frequency-weighting C, if available, otherwise for frequencyweighting A. The frequency weighting for tests with acoustical signals shall be determined at 125 Hz, 1 kHz, and 8 kHz. However, for information, this laboratory tests from 31.5Hz to 16kHz.

For frequency-weighting tests using a multi-frequency sound calibrator, the sound pressure level in the coupler of the sound calibrator shall preferably be set to the reference sound pressure level at 1 kHz, but shall be in the range from 70 dB to 125 dB at all frequencies.

At the discretion of the laboratory, the sound level meter shall be set to measure F-timeweighted sound level or S-time-weighted sound level. As a minimum, two repetitions of the coupling and measurements shall be performed to give a total of at least three tests.

The relative frequency weighting, relative to the response at 1 kHz, shall be determined from the average equivalent free-field or random-incidence sound level at a test frequency minus the average equivalent free-field or random-incidence sound level at 1 kHz. (Clause 12.15)

☑ Checked

7. Electrical Frequency Weighting

SLM Settings	
Time Weighting	Fast
Frequency Weighting	A
SLM Range	MID
Generator & Attenuator Settings	
Attenuation (dB)	20
Generator Frequency (Hz)	1k
SPL Reference (dB)	75
Integration Time (s)	N/A
Generator Output (mVrms)	56.70

Freq Hz	Output (mV)	Indication A	Output (mV)	Indication C	Output (mV)	Indication Z	Tolerance	
63	1157.67	74.9	62.17	74.9	56.70	74.9		
125	361.90	74.9	58.02	75.0	56.70	75.0		
250	152.61	74.9	56.70	75.0	56.70	75.0		
500	81.96	75.0	56.70	75.0	56.70	75.0		
1k	56.70	**75.0**	56.70	**75.0**	56.70	**75.0**		
2k	49.38	75.0	58.02	75.0	56.70	75.0		
4k	50.53	75.0	62.17	75.0	56.70	75.0		
8k	64.36	75.0	80.09	75.0	56.70	75.0		
16k	121.22	74.8	150.86	74.8	56.70	75.0		
Typical Microphone 0deg Free Field Response		0.00		0.00		0.00		
		0.00		0.00		0.00		
		0.00		0.00		0.00		
		0.00		0.00		0.00		
		0.05		**0.05**		**0.05**		
		0.10		0.10		0.10		
		0.00		0.00		0.00		
		0.30		0.30		0.30		
		0.77		0.77		0.77		
Case Effect Correction		0.00		0.00		0.00		
		0.00		0.00		0.00		
		0.00		0.00		0.00		
		0.00		0.00		0.00		
		0.00		**0.00**		**0.00**		
		0.00		0.00		0.00		
		0.00		0.00		0.00		
		0.00		0.00		0.00		
		0.00		0.00		0.00		
Windscreen Effect Correction		0.00		0.00		0.00		
		0.00		0.00		0.00		
		0.00		0.00		0.00		
		0.00		0.00		0.00		
		0.00		**0.00**		**0.00**		
		0.00		0.00		0.00		
		0.00		0.00		0.00		
		0.00		0.00		0.00		
		0.00		0.00		0.00		
OtherCorrection		0.00		0.00		0.00		
		0.00		0.00		0.00		
		0.00		0.00		0.00		
		0.00		0.00		0.00		
		0.00		**0.00**		**0.00**		
		0.00		0.00		0.00		
		0.00		0.00		0.00		
		0.00		0.00		0.00		
		0.00		0.00		0.00		
Equivalent Free Field		74.90		74.90		74.90		
		74.90		75.00		75.00		
		74.90		75.00		75.00		
		75.00		75.00		75.00		
		75.05		**75.05**		**75.05**		
		75.10		75.10		75.10		
		75.00		75.00		75.00		
		75.30		75.30		75.30		
		75.57		75.57		75.77	Type 1	Type 2
Response re 1kHz (Deviation from Expected)		-0.15		-0.15		-0.15	± 1.0	± 2.0
		-0.15		-0.05		-0.05	± 1.0	± 1.5
		-0.15		-0.05		-0.05	± 1.0	± 1.5
		-0.05		-0.05		-0.05	± 1.0	± 1.5
		0.00		**0.00**		**0.00**	± 0.7	± 1.0
		0.05		0.05		0.05	± 1.0	± 2.0
		-0.05		-0.05		-0.05	± 1.0	± 3.0
		0.25		0.25		0.25	+1.5; -2.5	± 5.0
		0.52		0.52		0.72	+2.5; -16.0	+5,-inf
Conforming		**Yes**		**Yes**		**Yes**		

Uncertainty (+/-) dB	0.09

Description of Tests

7. Electrical signal tests of frequency weightings (IEC 61672-3 Clause 13)
Frequency weightings shall be determined using steady sinusoidal electrical input signals for all frequency weightings for which design goals and acceptance limits are specified in IEC 61672-1 and which are provided in the sound level meter. The sound level meter shall be set to display F-time-weighted sound level.

On the reference level range and for each frequency weighting to be tested, the level of a 1 kHz input signal shall be adjusted to yield an indication that is 45 dB less than the upper boundary stated in the Instruction Manual for the linear operating range at 1 kHz on the reference level range.

At test frequencies other than 1 kHz, the level of the input electrical signal shall be determined as the level of the input signal at 1 kHz minus the exact design-goal response, given in IEC 61672-1 for the selected frequency weighting at the test frequency.

☑ Checked

8. Frequency & Time Weightings 1kHz

SLM Settings	
Time Weighting	Fast
Frequency Weighting	A
SLM Range	MID
Generator & Attenuator Settings	
Attenuation (dB)	0.0
Generator Frequency (Hz)	1k
SPL Reference (dB)	94.0
Output (mVrms)	50.7

8(a). Frequency Weightings 1kHz

Time Wt	Frequency Weighting				Tolerance	
Fast	A	C	Z	N/A		
1kHz	94.0	94.0	94.0		Type 1	Type 2
Difference		0.0	0.0		± 0.2	± 0.2

Conforming	Yes	Yes	N/A

Uncertainty (+/-) dB	0.09

8(b). Time Weightings 1kHz

Freq Wt	Time Weighting				Tolerance	
A	F	S	Leq			
1kHz	94.0	94.0	94.0		Type 1	Type 2
Difference		0.0	0.0		± 0.1	± 0.1

Conforming	Yes	Yes

Uncertainty (+/-) dB	0.09

Description of Tests

8. Frequency and time weightings at 1 kHz (IEC 61672-3 Clause 14)
For a steady sinusoidal electrical input signal at 1 kHz on the reference level range and with an input signal that yields an indication of the reference sound pressure level with frequency weighting A, the indications shall be recorded for frequency weightings C and Z, as available, with the sound level meter set to display F-time-weighted sound level, or timeaveraged sound level, as available. In addition, the indications with frequency weighting A shall be recorded with the sound level meter set to display F-time-weighted sound level, S-timeweighted sound level, and time-averaged sound level, as available.

The measured deviation of the indication of the sound level frequency weightings and time weightings shall not exceed the acceptance limits given in IEC 61672-1.

☑ Checked

9(a). Level Linearity 8kHz (Increasing)

SLM Settings	
Time Weighting	Fast
Frequency Weighting	A
SLM Range	MID
Generator & Attenuator Settings	
Attenuation (dB)	36.0
Generator Frequency (Hz)	8k
SPL Reference Starting Point (dB)	94.0
Output (mVrms)	3650.0
Noise Floor (dB)	7.8

Increasing level to Overload				Tolerance	
Atten	Expected	Indicator	Diff	Type 1	Type 2
31.0	99.0	99.0	0.0	± 0.8	± 1.1
26.0	104.0	104.0	0.0	± 0.8	± 1.1
21.0	109.0	109.0	0.0	± 0.8	± 1.1
16.0	114.0	114.0	0.0	± 0.8	± 1.1
15.0	115.0	115.0	0.0	± 0.8	± 1.1
14.0	116.0	116.0	0.0	± 0.8	± 1.1
13.0	117.0	117.0	0.0	± 0.8	± 1.1
12.0	118.0	118.0	0.0	± 0.8	± 1.1
11.0	119.0	119.0	0.0	± 0.8	± 1.1
10.0	120.0	120.0	0.0	± 0.8	± 1.1
9.0	121.0	121.0	0.0	± 0.8	± 1.1
8.0	122.0	122.0	0.0	± 0.8	± 1.1
7.0	123.0	123.0	0.0	± 0.8	± 1.1
6.0	124.0	124.0	0.0	± 0.8	± 1.1
5.0	125.0	Y		± 0.8	± 1.1
				± 0.8	± 1.1
				± 0.8	± 1.1
				± 0.8	± 1.1
				± 0.8	± 1.1
				± 0.8	± 1.1
				± 0.8	± 1.1
				± 0.8	± 1.1
				± 0.8	± 1.1
				± 0.8	± 1.1
				± 0.8	± 1.1
				± 0.8	± 1.1

Conforming	Yes

Uncertainty (+/-) dB	0.13

Description of Tests

9(a). Level linearity on the reference level range (IEC 61672-3 Clause 16)
Level linearity shall be tested with steady sinusoidal electrical signals at a frequency of 8 kHz with the sound level meter set for frequency-weighting A. (61672-3 Clause 16.1).

Level linearity shall be measured in 5 dB steps of increasing input signal level from the starting point up to within 5 dB of the upper boundary stated in the Instruction Manual for the linear operating range at 8 kHz, then at 1 dB steps of increasing input signal level up to, but not including, the first indication of overload. The test of level linearity shall then be continued at 5 dB steps of decreasing input signal level from the starting point down to within 5 dB of the specified lower boundary, then at 1 dB steps of decreasing input signal level down to, but not including, the first indication of an under-range condition.

Measured level linearity deviations shall not exceed the applicable acceptance limits given in IEC 61672-1 from the specified upper boundary of the linear operating range up to, but not including, the first indication of overload and also from the specified lower boundary of the linear operating range down to, but not including, the first indication of an under-range condition.

"Y" means indicator over-range.

☑ Checked

9(b). Level Linearity 8kHz (Decreasing)

SLM Settings	
Time Weighting	Fast
Frequency Weighting	A
SLM Range	MID
Generator & Attenuator Settings	
Attenuation (dB)	0.0
Generator Frequency (Hz)	8k
SPL Reference Starting Point (dB)	94
Output (mVrms)	57.6
Noise Floor (dB)	7.8

Decreasing level to Underange				Tolerance	
Atten	Expected	Indicator	Diff	Type 1	Type 2
5.0	89.0	89.0	0.0	± 0.8	± 1.1
10.0	84.0	84.0	0.0	± 0.8	± 1.1
15.0	79.0	79.0	0.0	± 0.8	± 1.1
20.0	74.0	74.0	0.0	± 0.8	± 1.1
25.0	69.0	69.0	0.0	± 0.8	± 1.1
30.0	64.0	64.0	0.0	± 0.8	± 1.1
35.0	59.0	59.0	0.0	± 0.8	± 1.1
40.0	54.0	54.0	0.0	± 0.8	± 1.1
45.0	49.0	49.0	0.0	± 0.8	± 1.1
49.0	45.0	45.0	0.0	± 0.8	± 1.1
50.0	44.0	43.9	-0.1	± 0.8	± 1.1
51.0	43.0	43.0	0.0	± 0.8	± 1.1
52.0	42.0	42.0	0.0	± 0.8	± 1.1
53.0	41.0	41.0	0.0	± 0.8	± 1.1
54.0	40.0	40.0	0.0	± 0.8	± 1.1
55.0	39.0	39.0	0.0	± 0.8	± 1.1
56.0	38.0	38.0	0.0	± 0.8	± 1.1
57.0	37.0	37.0	0.0	± 0.8	± 1.1
58.0	36.0	36.0	0.0	± 0.8	± 1.1
59.0	35.0	35.0	0.0	± 0.8	± 1.1
60.0	34.0	34.0	0.0	± 0.8	± 1.1
61.0	33.0	33.1	0.1	± 0.8	± 1.1
62.0	32.0	32.1	0.1	± 0.8	± 1.1
63.0	31.0	31.2	0.2	± 0.8	± 1.1
64.0	30.0	30.2	0.2	± 0.8	± 1.1

Conforming	Yes

Uncertainty (+/-) dB	0.13

Description of Tests

9(b). Level linearity on the reference level range (IEC 61672-3 Clause 16)
Level linearity shall be tested with steady sinusoidal electrical signals at a frequency of 8 kHz with the sound level meter set for frequency-weighting A. (61672-3 Clause 16.1).

Level linearity shall be measured in 5 dB steps of increasing input signal level from the starting point up to within 5 dB of the upper boundary stated in the Instruction Manual for the linear operating range at 8 kHz, then at 1 dB steps of increasing input signal level up to, but not including, the first indication of overload. The test of level linearity shall then be continued at 5 dB steps of decreasing input signal level from the starting point down to within 5 dB of the specified lower boundary, then at 1 dB steps of decreasing input signal level down to, but not including, the first indication of an under-range condition.

Measured level linearity deviations shall not exceed the applicable acceptance limits given in IEC 61672-1 from the specified upper boundary of the linear operating range up to, but not including, the first indication of overload and also from the specified lower boundary of the linear operating range down to, but not including, the first indication of an under-range condition.

"Y" means indicator under-range. However, if 20dB above noise floor is reached then no results are reported.

☑ Checked

10. Level Linearity with Level Ranges 1kHz

10(a). Level Linearity Including the Level Range (Reference Signal)

SLM Settings	
Time Weighting	Fast
Frequency Weighting	A
SLM Range	MID
Generator & Attenuator Settings	
Attenuation (dB)	0
Generator Frequency (Hz)	1k
Reference SPL (dB)	94
Output (mVrms)	50.7

Settings	Level (dB)			Tolerance	
Range	Expected	Indicated	Difference	Type 1	Type 2
HIGH	94.0	94.0	0.0	± 0.8	± 1.1
MID	94.0	94.0	0.0	± 0.8	± 1.1
LOW	94.0	94.0	0.0	± 0.8	± 1.1
				± 0.8	± 1.1
				± 0.8	± 1.1
				± 0.8	± 1.1
				± 0.8	± 1.1
				± 0.8	± 1.1
				± 0.8	± 1.1
				± 0.8	± 1.1

Conforming	Yes

Uncertainty (+/-) dB	0.13

10(b). Level Linearity Including the Level range (5dB Above Under-range)

SLM Settings	
Time Weighting	Fast
Frequency Weighting	A
SLM Range	HIGH
Generator & Attenuator Settings	
Attenuation (dB)	30
Generator Frequency (Hz)	1k
Reference SPL (dB)	65
Output (mVrms)	56.7

Settings		Level (dB)			Tolerance	
Range	Atten	Expected	Indicated	Difference	Type 1	Type 2
HIGH	30.0	65.0	65.0	0.0	± 0.8	± 1.1
MID	50.0	45.0	44.9	-0.1	± 0.8	± 1.1
LOW	70.0	25.0	25.0	0.0	± 0.8	± 1.1
					± 0.8	± 1.1
					± 0.8	± 1.1
					± 0.8	± 1.1
					± 0.8	± 1.1
					± 0.8	± 1.1
					± 0.8	± 1.1
					± 0.8	± 1.1
					± 0.8	± 1.1

Conforming	Yes

Uncertainty (+/-) dB	0.13

Description of Tests

10. Level linearity including the level range control (IEC 61672-3 Clause 17)
For sound level meters that have more than one level range, tests of level linearity errors including errors introduced by the level range control shall be performed with steady sinusoidal electrical input signals at a frequency of 1 kHz and with the sound level meter set for frequency weighting A. For each test, signal levels shall be recorded as indications of F-time-weighted sound level or time-average sound level. (61672-3 Clause 17.1).

With the input signal level kept constant, the indicated signal level shall be recorded for all level ranges where the signal level is displayed. The indicated signal levels and the corresponding anticipated indications of signal levels shall be recorded. (61672-3 Clause 17.3).

For each level range, the level of the input signal shall then be adjusted to yield a signal level that is expected to be 5 dB greater than the signal level that first causes an indication of under-range on a level range. The indicated signal levels and the corresponding anticipated levels shall be recorded. (61672-3 Clause 17.4).

Level linearity deviations shall be calculated as an indicated signal level minus the corresponding anticipated signal level. Measured level linearity deviations shall not exceed the applicable acceptance limits given in IEC 61672-1.

☑ Checked

11. Toneburst Response

11(a). Fast ToneBurst

SLM Settings - Fast	
Time Weighting	Fast
Frequency Weighting	A
SLM Range	MID
Generator & Attenuator Settings	
Attenuation (dB)	0.0
Generator Frequency (Hz)	4k
dB Down from Linearity Limit	3
Reference SPL (dB)	117.0
Output (mVrms)	640.0

Toneburst (ms)	# Cycles	L_{AFMax} (dB)			Tolerance	
		Expected	Indicated	Difference	Type 1	Type 2
200	800	116.0	116.0	0.0	± 0.5	± 1.0
2	8	99.0	99.0	0.0	+ 1.0; -1.5	+ 1.0; -2.5
0.25	1	90.0	89.9	-0.1	+ 1.0; -3.0	+ 1.5; -5.0

Conforming	Yes

Uncertainty (+/-) dB	0.09

11(b). Slow ToneBurst

SLM Settings - Slow	
Time Weighting	Slow
Frequency Weighting	A
SLM Range	MID
Generator & Attenuator Settings	
Attenuation (dB)	0.0
Generator Frequency (Hz)	4k
dB Down from Linearity Limit	3
Reference SPL (dB)	117.0
Output (mVrms)	640.0

Toneburst (ms)	# Cycles	L_{ASMax} (dB)			Tolerance	
		Expected	Indicated	Difference	Type 1	Type 2
200	800	109.6	109.6	0.0	± 0.5	± 1.0
2	8	90.0	90	0.0	+ 1.0; -3.0	+ 1.0; -5.0

Conforming	Yes

Uncertainty (+/-) dB	0.09

11(c). SEL ToneBurst

SLM Settings - SEL/Leq	
Function	SEL
Frequency Weighting	A
SLM Range	MID
Generator & Attenuator Settings	
Attenuation (dB)	0.0
Generator Frequency (Hz)	4k
dB Down from Linearity Limit	3
Reference SPL (dB)	117.0
Output (mVrms)	640.0
Integration Time (if SEL not available) (s)	

Toneburst (ms)	# Cycles	SEL				Tolerance	
		Indicated	Calc'd	Expected	Difference	Type 1	Type 2
200	800	110.0	110.0	110.0	0.0	± 0.5	± 1.0
2	8	90.0	90.0	90.0	0.0	+ 1.0; -1.5	+ 1.0; -2.5
0.25	1	80.9	80.9	81.0	-0.1	+ 1.0; -3.0	+ 1.5; -5.0

Conforming	Yes

Uncertainty (+/-) dB	0.13

Description of Tests

11. Toneburst response (IEC 61672-3 Clause 18)
The response of the sound level meter to short-duration signals shall be tested on the reference level range with 4 kHz tonebursts. The sound level meter shall be set to frequency weighting A. (61672-3 Clause 18.1).

For the toneburst signals, indications of the sound level meter to be recorded are:
- maximum F-time-weighted sound level;
- maximum S-time-weighted sound level; and
- sound exposure level, as applicable.

The level of the steady input signal shall be adjusted to display an F-time-weighted, Stime-weighted, or time-averaged sound level, as appropriate, that is 3 dB less than the upper boundary stated in the Instruction Manual for the linear operating range at 4 kHz on the reference level range. (61672-3 Clause 18.4).

Tonebursts are tested at 200ms, 2ms and, 0.25ms durations (the latter for Fast and SEL only) and the LMax or SEL recorded.

Measured deviations of the measured toneburst responses from the corresponding reference toneburst responses given in IEC 61672-1 shall not exceed the applicable acceptance limits given in IEC 61672-1.

☑ Checked

12. Peak C sound level

12(a). Peak C 8 KHz

SLM Settings	
Time Weighting	Fast
Frequency Weighting	C
SLM Range	MID
Generator & Attenuator Settings	
Attenuation (dB)	0.0
Generator Frequency (Hz)	8k
Reference SPL (dB)	112.0
Output (mVrms)	572.0

Test Signal	dB LCpeak Hold				Tolerance	
8 kHz	Indication	O'Load?	Expected	Difference	Type 1	Type 2
1 Cycle	115.4	No	115.4	0.0	± 2.0	± 3.0

Conforming	Yes

Uncertainty (+/-) dB	0.09

12(b). Peak C 500 Hz

SLM Settings	
Time Weighting	Fast
Frequency Weighting	C
SLM Range	MID
Generator & Attenuator Settings	
Attenuation (dB)	0.0
Generator Frequency (Hz)	500
Reference SPL (dB)	112.0
Output (mVrms)	400.0

Test Signal	dB LCpeak Hold				Tolerance	
500 Hz	Indication	O'Load?	Expected	Difference	Type 1	Type 2
One +ve 1/2 cycle	114.2	No	114.4	-0.2	± 1.0	± 2.0
One -ve 1/2 cycle	114.2	No	114.4	-0.2	± 1.0	± 2.0

Conforming	Yes

Uncertainty (+/-) dB	0.09

Description of Tests

12. Peak C sound level (IEC 61672-3 Clause 19)
Indications of C-weighted peak sound level shall be tested on the least-sensitive level range. The test signals consist of (a) a single complete cycle of an 8 kHz sinusoid starting and stopping at zero crossings and (b) positive and negative half cycles of a 500 Hz sinusoid that also start and stop at zero crossings.

The level of the steady sinusoidal 8 kHz electrical input signal, from which a single complete cycle is extracted, shall be adjusted to yield an indication of C-weighted, F-timeweighted sound level, or C-weighted, time-averaged sound level, that is 8 dB less than the upper boundary stated in the Instruction Manual for the peak level range at 8 kHz on the leastsensitive level range. The indication of steady sound level shall be recorded.

The indication of C-weighted peak sound level in response to a complete cycle of the 8 kHz signal shall be recorded. Application of the complete-cycle 8 kHz signal shall not cause indication of an overload condition.

The level of the steady sinusoidal 500 Hz electrical input signal, from which positive and negative half cycles are extracted, shall be adjusted to yield an indication of C-weighted, Ftime-weighted sound level, or C-weighted, time-averaged sound level, that is 8 dB less than the upper boundary stated in the Instruction Manual for the peak level range on the least-sensitive level range. The indications of steady sound levels shall be recorded.

The indications of C-weighted peak sound level in response to a single positive halfcycle 500 Hz signal and to a single negative half-cycle 500 Hz signal shall be recorded and reported. Applications of the 500 Hz half-cycle signals shall not cause indications of an overload condition.

☑ Checked

13. Overload indication

SLM Settings	
Function	Leq
Frequency Weighting	A
SLM Range	MID
Generator & Attenuator Settings	
Attenuation (dB)	0.0
Generator Frequency (Hz)	4k
Reference SPL (dB)	119.0
Output (mVrms)	799.0

	Half-Cycle Signal			Tolerance	
	Positive	Negative	Difference	Type 1	Type 2
Level (dB)	124.0	124.1	-0.1	± 1.5	± 1.5
Generator Output (mVrms)	1459.0	1489.0			

Conforming	Yes

Uncertainty (+/-) dB	0.09

Overload Indicated	No
Overload Indicator Latches	N/A

Conforming	N/A

Description of Tests

13. Overload Indication (IEC 61672-3 Clause 20)
The test of overload indication shall only be performed for sound level meters capable of displaying time-average sound level.

Overload indication shall be tested on the least-sensitive level range with the sound level meter set to display A-weighted, time-average sound level. Positive and negative one-half-cycle sinusoidal electrical signals at a frequency of 4 kHz shall be used.(IEC 61672-3 Clause 20.2)

The test shall begin at an indicated time-averaged level for the steady input signal that corresponds to 1 dB less than the upper boundary specified for the linear operating range at 4 kHz. The level of the single positive one-half-cycle input signal shall be increased to the first indication of overload, to a resolution of 0.1 dB. The process shall be repeated for the single negative one-half-cycle signal. The levels of the single one-half-cycle input signals that produced the first indications of overload shall be recorded to a resolution of 0.1 dB.

It shall be verified that the overload indicator latches on as specified in IEC 61672-1 when an overload condition occurs.

☑ Checked

14. High-level Stability

SLM Settings	
Time Weighting	F
Frequency Weighting	A
SLM Range	MID
Generator & Attenuator Settings	
Attenuation (dB)	0.0
Generator Frequency (Hz)	1k
Reference SPL (dB)	119.0
Output (mVrms)	899.0

Time Period to Apply Signal (min)	5.0
Record SPL at Conclusion of Time Period (dB)	119.0
Difference	0.0
Tolerance	± 0.1

Conforming	Yes

Uncertainty (+/-) dB	0.09

Description of Tests

14. High-level Stability (IEC 61672-3 Clause 21)
The ability of a sound level meter to operate continuously in response to high signal levels without significant change in sensitivity is evaluated from the difference between the Aweighted sound levels indicated in response to a steady 1 kHz electrical signal at the beginning and end of a 5 min period of continuous exposure to the signal.

The level of the steady electrical input signal shall be that which is required to display the sound level that is 1 dB less than the upper boundary of the 1 kHz linear operating range on the least-sensitive level range.

☑ Checked

15(a). Octave Band Filter

SLM, Attenuator & Generator Settings	
Time Weighting	Fast
Frequency Weighting	Z
Range	MID
Set dB Below Full Scale	-3
Attenuator dB	0.0
Reference SPL 1kHz	117.0
Output mVrms	712.9
Noise Floor dB	17.2

Ratio	1	2	3	4	5	6	7	8	9	10	Tolerance	
Freq	4 Hz	8 Hz	16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz		
0.06		27.1	27.7	27.1	27.6	34.1	33.3	34.0	33.6	33.0		
0.13		29.2	30.5	29.8	35.1	35.4	35.0	34.8	35.1	35.0		
0.25		42.7	38.8	36.0	39.9	42.8	40.0	40.0	40.4	40.6		
0.50		63.3	59.8	58.5	56.8	54.8	54.6	54.7	54.7	54.7		
0.71		114.4	114.8	114.3	114.2	114.5	114.5	114.5	114.5	114.5		
0.77		117.3	117.6	116.9	116.9	117.0	117.0	117.0	117.0	117.0		
0.84		117.4	117.5	116.9	116.9	117.0	117.0	117.0	117.0	117.0		
0.92		117.5	117.4	116.8	116.9	117.0	117.0	116.9	116.9	116.9		
1.00		**117.5**	**117.3**	**116.8**	**116.9**	**117.0**	**117.0**	**117.0**	**117.0**	**117.0**		
1.09		117.6	117.2	116.9	116.9	117.0	117.0	117.0	117.0	117.0		
1.19		117.7	117.2	116.9	116.9	117.0	117.0	117.0	117.0	117.0		
1.30		117.7	117.2	116.9	116.9	117.1	117.0	117.0	117.0	117.0		
1.41		114.5	113.7	113.6	113.4	113.7	113.6	113.5	113.5	113.5		
2.00		30.1	29.9	30.0	32.8	24.6	24.8	24.8	24.6	24.4		
4.00		17.0	13.4	25.5	18.2	18.6	18.4	21.1	19.6	37.7		
8.00		18.9	13.5	15.0	16.1	16.5	18.1	20.6	20.4	21.1		
16.00		15.9	14.2	13.9	17.0	17.2	18.6	21.3	20.6	20.0	Class 1	Class 2
Attenuation dB		90.4	89.6	89.7	89.3	82.9	83.7	83.0	83.4	84.0	+70/inf	+60/inf
		88.3	86.8	87.0	81.8	81.6	82.0	82.2	81.9	82.0	+61/inf	+55/inf
		74.8	78.5	80.8	77.0	74.2	77.0	77.0	76.6	76.4	+42/inf	+41/inf
		54.2	57.5	58.3	60.1	62.2	62.4	62.3	62.3	62.3	+17.5/inf	+16.5/inf
		3.1	2.5	2.5	2.7	2.5	2.5	2.5	2.5	2.5	+2/+5	+1.6/+5.5
		0.2	-0.3	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	-.3/+1.3	-.5/+1.6
		0.1	-0.2	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	-.3/+.6	-.5/+.8
		0.0	-0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	-.3/+.4	-.5/+.6
		0.0	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	-.3/+.3	-.5/+.5
		-0.1	0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	-.3/+.4	-.5/+.6
		-0.2	0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	-.3/+.6	-.5/+.8
		-0.2	0.1	-0.1	0.0	-0.1	0.0	0.0	0.0	0.0	-.3/+1.3	-.5/+1.6
		3.0	3.6	3.2	3.5	3.3	3.4	3.5	3.5	3.5	+2/+5	+1.6/+5.5
		87.4	87.4	86.8	84.1	92.4	92.2	92.2	92.4	92.6	+17.5/inf	+16.5/inf
		100.5	103.9	91.3	98.7	98.4	98.6	95.9	97.4	79.3	+42/inf	+41/inf
		98.6	103.8	101.8	100.8	100.5	98.9	96.4	96.6	95.9	+61/inf	+55/inf
		101.6	103.1	102.9	99.9	99.8	98.4	95.7	96.4	97.0	+70/inf	+60/inf
Ins Loss		0.5	0.3	-0.2	-0.1	0.0	0.0	0.0	0.0	0.0		
Conforming	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		

Uncert (+/-) dB	0.09

Description of Test

15(a) Octave Filter (AS 4476 Clause 5.3)
The relative attenuation characteristic of each filter in a filter set shall be measured on the reference level range. The level of the input signals shall be within 1dB of the upper boundary of the linear operating range. A steady sinusoidal signal is applied to the input of the filter set. The levels of input and output signals at appropriate frequencies are measured.
For periodic verification of compliance with the tolerances indicated above for Class 1 and Class 2 filters, the input signal frequencies are the 17 octave or third-octave band normalized frequencies indicated in the "Freq" column in the table above.

Interpretation: The yellow cells are the observed values. The "Attenuation dB" cells are the attenuation values of each filter with the filter's centre frequency attenuation assumed to be zero (i.e. the relative attenuation). The "Ins Loss" are the actual values of attenuation at the filter centre frequencies. Values in the "Difference" cells are left blank if the observed value is less than 20dB above the noise floor.

☑ Checked

15(b). Octave Band Filter

SLM, Attenuator & Generator Settings	
Time Weighting	Fast
Frequency Weighting	Z
SLM Range	MID
Set dB Below Full Scale	-3.0
Attenuator dB	0.0
Reference SPL 1kHz	117.0
Output mVrms	712.9
Noise Floor dB	17.2

NOTE: Last entry fails which is a feature of the instrument not a defect

Ratio	1	2	3	4	5	6	7	8	9	10	Tolerance	
Freq	4kHz	8kHz	16kHz	32kHz								
0.06	33.0	41.5	38.3									
0.13	35.0	41.7	41.6									
0.25	40.9	43.0	43.1									
0.50	54.7	54.8	54.8									
0.71	114.5	114.5	114.5									
0.77	117.0	117.0	117.0									
0.84	117.0	117.0	117.0									
0.92	116.9	116.9	117.0									
1.00	**117.0**	**117.0**	**117.0**									
1.09	117.0	117.0	117.0									
1.19	117.0	117.0	117.0									
1.30	117.0	117.0	117.0									
1.41	113.5	113.5	113.5									
2.00	25.0	38.3	39.4									
4.00	35.0	33.3	31.0									
8.00	33.4	30.3	25.6									
16.00	23.9	28.7									Class 1	Class 2
Attenuation dB	84.0	75.5	78.7								+70/inf	+60/inf
	82.0	75.3	75.4								+61/inf	+55/inf
	76.1	74.0	73.9								+42/inf	+41/inf
	62.3	62.2	62.2								+17.5/inf	+16.5/inf
	2.5	2.5	2.5								+2/+5	+1.6/+5.5
	0.0	0.0	0.0								-.3/+1.3	-.5/+1.6
	0.0	0.0	0.0								-.3/+.6	-.5/+.8
	0.1	0.1	0.0								-.3/+.4	-.5/+.6
	0.0	**0.0**	**0.0**								-.3/+.3	-.5/+.5
	0.0	0.0	0.0								-.3/+.4	-.5/+.6
	0.0	0.0	0.0								-.3/+.6	-.5/+.8
	0.0	0.0	0.0								-.3/+1.3	-.5/+1.6
	3.5	3.5	3.5								+2/+5	+1.6/+5.5
	92.0	78.7	77.6								+17.5/inf	+16.5/inf
	82.0	83.7	86.0								+42/inf	+41/inf
	83.6	86.7	91.4								+61/inf	+55/inf
	93.1	88.3									+70/inf	+60/inf
Ins Loss	0.0	0.0	0.0									
Conforming	Yes	Yes	Yes	N/A	N/A	N/A	N/A	N/A	N/A	N/A		

Uncert (+/-) dB	0.09

Description of Test

15(b) Octave Filter (AS 4476 Clause 5.3)
The relative attenuation characteristic of each filter in a filter set shall be measured on the reference level range. The level of the input signals shall be within 1dB of the upper boundary of the linear operating range. A steady sinusoidal signal is applied to the input of the filter set. The levels of input and output signals at appropriate frequencies are measured.
For periodic verification of compliance with the tolerances indicated above for Class 1 and Class 2 filters, the input signal frequencies are the 17 octave or third-octave band normalized frequencies indicated in the "Freq" column in the table above.

Interpretation: The yellow cells are the observed values. The "Attenuation dB" cells are the attenuation values of each filter with the filter's centre frequency attenuation assumed to be zero (i.e. the relative attenuation). The "Ins Loss" are the actual values of attenuation at the filter centre frequencies. Values in the "Difference" cells are left blank if the observed value is less than 20dB above the noise floor.

☑ Checked

16(a). Third Octave Band Filter

SLM, Attenuator & Generator Settings	
Time Weighting	Fast
Frequency Weighting	Z
SLM Range	MID
Set dB Below Full Scale	-3
Attenuator dB	0.0
Reference SPL 1kHz	117.0
Output mVrms	712.9
Noise Floor dB	17.2

Ratio	1	2	3	4	5	6	7	8	9	10	Tolerance	
Freq	4Hz	5Hz	6.3Hz	8Hz	10Hz	12.5Hz	16Hz	20Hz	25Hz	31.5Hz		
0.18			22.4	22.1	23.7	30.4	25.0	25.5	31.8	25.6		
0.33			52.0	42.1	40.2	35.8	31.0	25.0	30.9	35.1		
0.53			64.1	62.4	60.7	58.7	57.1	56.3	55.7	54.5		
0.77			75.8	54.0	47.6	75.1	54.2	43.4	74.5	53.5		
0.89			114.4	114.8	115.0	115.0	114.8	114.5	114.3	114.2		
0.92			116.7	117.1	117.3	117.1	116.9	116.7	116.3	116.4		
0.95			117.4	117.7	117.8	117.5	117.4	117.1	116.8	116.9		
0.97			117.3	117.6	117.8	117.6	117.4	117.1	116.9	116.9		
1.00			**117.3**	**117.6**	**117.7**	**117.5**	**117.3**	**117.1**	**116.9**	**116.9**		
1.03			117.4	117.7	117.8	117.6	117.3	117.1	116.9	116.9		
1.06			117.5	117.7	117.7	117.5	117.3	117.0	116.9	116.9		
1.09			116.7	117.7	117.0	116.7	116.5	116.2	116.1	116.1		
1.12			114.2	114.4	114.5	114.2	113.8	113.7	113.6	113.5		
1.30			56.2	51.1	72.1	55.8	50.3	71.4	55.3	50.2		
1.89			26.2	15.4	35.3	12.2	8.7	34.9	22.5	12.5		
3.07			10.6	11.6	14.0	15.4	10.5	10.1	9.1	9.7		
5.43			12.9	9.4	9.8	11.0	11.0	9.5	7.3	10.6	Class 1	Class 2
Attenuation dB			94.9	95.5	94.0	87.1	92.3	91.6	85.1	91.3	+70/inf	+60/inf
			65.3	75.5	77.5	81.7	86.3	92.1	86.0	81.8	+61/inf	+55/inf
			53.2	55.2	57.0	58.8	60.2	60.8	61.2	62.4	+42/inf	+41/inf
			41.5	63.6	70.1	42.4	63.1	73.7	42.4	63.4	+17.5/inf	+16.5/inf
			2.9	2.8	2.7	2.5	2.5	2.6	2.6	2.7	+2/+5	+1.6/+5.5
			0.6	0.5	0.4	0.4	0.4	0.4	0.6	0.5	-.3/+1.3	-.5/+1.6
			-0.1	-0.1	-0.1	0.0	-0.1	0.0	0.1	0.0	-.3/+.6	-.5/+.8
			0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	-.3/+.4	-.5/+.6
			0.0	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	-.3/+.3	-.5/+.5
			-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	-.3/+.4	-.5/+.6
			-0.2	-0.1	0.0	0.0	0.0	0.1	0.0	0.0	-.3/+.6	-.5/+.8
			0.6	-0.1	0.7	0.8	0.8	0.9	0.8	0.8	-.3/+1.3	-.5/+1.6
			3.1	3.2	3.2	3.3	3.5	3.4	3.3	3.4	+2/+5	+1.6/+5.5
			61.1	66.5	45.6	61.7	67.0	45.7	61.6	66.7	+17.5/inf	+16.5/inf
			91.1	102.2	82.4	105.3	108.6	82.2	94.4	104.4	+42/inf	+41/inf
			106.7	106.0	103.7	102.1	106.8	107.0	107.8	107.2	+61/inf	+55/inf
			104.4	108.2	107.9	106.5	106.3	107.6	109.6	106.3	+70/inf	+60/inf
Ins Loss			0.3	0.6	0.7	0.5	0.3	0.1	-0.1	-0.1		
Conforming	N/A	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		

Uncert (+/-) dB	0.09

Description of Test

16(a) Third Octave Filter (AS 4476 Clause 5.3)
The relative attenuation characteristic of each filter in a filter set shall be measured on the reference level range. The level of the input signals shall be within 1dB of the upper boundary of the linear operating range. A steady sinusoidal signal is applied to the input of the filter set. The levels of input and output signals at appropriate frequencies are measured.
For periodic verification of compliance with the tolerances indicated above for Class 1 and Class 2 filters, the input signal frequencies are the 17 octave or third-octave band normalized frequencies indicated in the "Freq" column in the table above.

Interpretation: The yellow cells are the observed values. The "Attenuation dB" cells are the attenuation values of each filter with the filter's centre frequency attenuation assumed to be zero (i.e. the relative attenuation). The "Ins Loss" are the actual values of attenuation at the filter centre frequencies. Values in the "Difference" cells are left blank if the observed value is less than 20dB above the noise floor.

☑ Checked

16(b). Third Octave Band Filter

SLM, Attenuator & Generator Settings	
Time Weighting	Fast
Frequency Weighting	Z
SLM Range	MID
Set dB Below Full Scale	-3.0
Attenuator dB	0.0
Reference SPL 1kHz	117.0
Output mVrms	712.9
Noise Floor dB	17.2

Ratio	1	2	3	4	5	6	7	8	9	10	Tolerance	
Freq	40Hz	50Hz	63Hz	80Hz	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz		
0.18	26.0	35.2	26.1	32.2	33.7	30.7	24.4	33.2	29.8	23.5		
0.33	37.7	38.9	39.3	41.1	41.8	42.4	41.6	36.5	37.1	40.0		
0.53	52.8	51.2	49.7	47.5	45.0	39.4	31.2	29.9	36.3	35.2		
0.77	43.2	74.2	53.5	39.3	73.7	55.2	60.6	73.8	54.9	60.6		
0.89	114.1	114.2	114.2	114.2	114.4	114.6	114.4	114.5	114.6	114.4		
0.92	116.4	116.3	116.4	116.5	116.5	116.7	116.6	116.5	116.7	116.6		
0.95	116.9	116.9	116.9	116.9	117.0	117.1	117.0	117.0	117.0	117.0		
0.97	116.9	116.9	116.9	116.9	116.9	117.0	117.0	117.0	117.0	117.0		
1.00	**116.9**	**116.9**	**116.9**	**116.9**	**116.9**	**117.0**	**117.0**	**117.0**	**117.0**	**117.0**		
1.03	116.9	116.9	116.9	116.9	117.0	117.0	117.1	117.0	117.0	117.0		
1.06	116.8	116.9	116.9	116.9	116.9	117.0	117.0	117.0	117.0	117.0		
1.09	116.1	116.1	116.2	116.2	116.3	116.2	116.4	116.3	116.2	116.3		
1.12	113.6	113.6	113.5	113.4	113.4	113.5	113.7	113.4	113.5	113.6		
1.30	71.3	55.4	50.2	48.8	47.3	42.2	65.2	47.0	42.1	65.1		
1.89	34.8	43.4	29.4	20.1	15.4	35.7	15.1	15.2	35.7	18.4		
3.07	28.7	22.8	11.4	10.7	15.2	13.8	13.7	15.4	13.4	14.3		
5.43	10.5	14.3	11.3	9.9	12.4	14.8	14.8	14.7	13.9	14.2	Class 1	Class 2
Attenuation dB	90.9	81.7	90.8	84.7	83.2	86.3	92.6	83.8	87.2	93.5	+70/inf	+60/inf
	79.2	78.0	77.6	75.8	75.1	74.6	75.4	80.5	79.9	77.0	+61/inf	+55/inf
	64.1	65.7	67.2	69.4	71.9	77.6	85.8	87.1	80.7	81.8	+42/inf	+41/inf
	73.7	42.7	63.4	77.6	43.2	61.8	56.4	43.2	62.1	56.4	+17.5/inf	+16.5/inf
	2.8	2.7	2.7	2.7	2.5	2.4	2.6	2.5	2.4	2.6	+2/+5	+1.6/+5.5
	0.5	0.6	0.5	0.4	0.4	0.3	0.4	0.5	0.3	0.4	-.3/+1.3	-.5/+1.6
	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	-.3/+.6	-.5/+.8
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.3/+.4	-.5/+.6
	0.0	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	-.3/+.3	-.5/+.5
	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	0.0	0.0	0.0	-.3/+.4	-.5/+.6
	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.3/+.6	-.5/+.8
	0.8	0.8	0.7	0.7	0.6	0.8	0.6	0.7	0.8	0.7	-.3/+1.3	-.5/+1.6
	3.3	3.3	3.4	3.5	3.5	3.5	3.3	3.6	3.5	3.4	+2/+5	+1.6/+5.5
	45.6	61.5	66.7	68.1	69.6	74.8	51.8	70.0	74.9	51.9	+17.5/inf	+16.5/inf
	82.1	73.5	87.5	96.8	101.5	81.3	101.9	101.8	81.3	98.6	+42/inf	+41/inf
	88.2	94.1	105.5	106.2	101.7	103.2	103.3	101.6	103.6	102.7	+61/inf	+55/inf
	106.4	102.6	105.6	107.0	104.5	102.2	102.2	102.3	103.1	102.8	+70/inf	+60/inf

Ins Loss	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0

Conforming	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Uncert (+/-) dB	0.09

Description of Test

16(b) Third Octave Filter (AS 4476 Clause 5.3)
The relative attenuation characteristic of each filter in a filter set shall be measured on the reference level range. The level of the input signals shall be within 1dB of the upper boundary of the linear operating range. A steady sinusoidal signal is applied to the input of the filter set. The levels of input and output signals at appropriate frequencies are measured.
For periodic verification of compliance with the tolerances indicated above for Class 1 and Class 2 filters, the input signal frequencies are the 17 octave or third-octave band normalized frequencies indicated in the "Freq" column in the table above.

Interpretation: The yellow cells are the observed values. The "Attenuation dB" cells are the attenuation values of each filter with the filter's centre frequency attenuation assumed to be zero (i.e. the relative attenuation). The "Ins Loss" are the actual values of attenuation at the filter centre frequencies. Values in the "Difference" cells are left blank if the observed value is less than 20dB above the noise floor.

☑ Checked

16(c). Third Octave Band Filter

SLM, Attenuator & Generator Settings	
Time Weighting	Fast
Frequency Weighting	Z
SLM Range	MID
Set dB Below Full Scale	-3.0
Attenuator dB	0.0
Reference SPL 1kHz	117.0
Output mVrms	712.9
Noise Floor dB	17.2

Ratio	1	2	3	4	5	6	7	8	9	10	Tolerance	
Freq	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz		
0.18	33.2	29.9	21.5	33.2	29.9	21.1	33.2	29.9	21.1	33.2		
0.33	37.0	37.9	40.2	37.4	38.0	40.3	37.7	38.4	40.5	38.3		
0.53	35.1	37.6	35.7	35.2	37.8	35.8	35.4	37.9	36.0	35.7		
0.77	73.8	54.7	60.6	73.8	54.6	60.6	73.8	54.5	60.5	73.8		
0.89	114.5	114.5	114.4	114.5	114.5	114.4	114.5	114.5	114.4	114.5		
0.92	116.6	116.7	116.6	116.6	116.6	116.6	116.6	116.6	116.6	116.6		
0.95	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0		
0.97	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0		
1.00	**117.0**	**117.0**	**117.0**	**117.0**	**117.0**	**117.0**	**117.0**	**117.0**	**117.0**	**117.0**		
1.03	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0		
1.06	117.0	116.9	117.0	117.0	117.0	116.9	117.0	117.0	116.9	117.0		
1.09	116.3	116.2	116.3	116.3	116.2	116.3	116.3	116.2	116.3	116.3		
1.12	113.4	113.5	113.5	113.4	113.5	113.5	113.4	113.5	113.5	113.4		
1.30	47.0	42.1	65.0	47.0	42.1	65.0	47.0	42.1	65.0	47.0		
1.89	19.3	35.7	15.5	15.5	35.7	15.0	16.3	35.6	15.4	27.7		
3.07	19.4	12.4	14.0	16.1	16.5	15.7	15.5	15.8	16.6	17.3		
5.43	14.3	14.1	14.6	14.0	15.3	16.0	16.6	16.9	17.5	17.1	Class 1	Class 2
Attenuation dB	83.8	87.1	95.5	83.8	87.1	95.9	83.8	87.1	95.9	83.8	+70/inf	+60/inf
	80.0	79.1	76.8	79.6	79.0	76.7	79.3	78.6	76.5	78.7	+61/inf	+55/inf
	81.9	79.4	81.3	81.8	79.2	81.2	81.6	79.1	81.0	81.3	+42/inf	+41/inf
	43.2	62.3	56.4	43.2	62.4	56.4	43.2	62.5	56.5	43.2	+17.5/inf	+16.5/inf
	2.5	2.5	2.6	2.5	2.5	2.6	2.5	2.5	2.6	2.5	+2/+5	+1.6/+5.5
	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	-.3/+1.3	-.5/+1.6
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.3/+.6	-.5/+.8
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.3/+.4	-.5/+.6
	0.0	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	-.3/+.3	-.5/+.5
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-.3/+.4	-.5/+.6
	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	-.3/+.6	-.5/+.8
	0.7	0.8	0.7	0.7	0.8	0.7	0.7	0.8	0.7	0.7	-.3/+1.3	-.5/+1.6
	3.6	3.5	3.5	3.6	3.5	3.5	3.6	3.5	3.5	3.6	+2/+5	+1.6/+5.5
	70.0	74.9	52.0	70.0	74.9	52.0	70.0	74.9	52.0	70.0	+17.5/inf	+16.5/inf
	97.7	81.3	101.5	101.5	81.3	102.0	100.7	81.4	101.6	89.3	+42/inf	+41/inf
	97.6	104.6	103.0	100.9	100.5	101.3	101.5	101.2	100.4	99.7	+61/inf	+55/inf
	102.7	102.9	102.4	103.0	101.7	101.0	100.4	100.1	99.5	99.9	+70/inf	+60/inf

Ins Loss	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Conforming	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Uncert (+/-) dB	0.09

Description of Test

16(c) Third Octave Filter (AS 4476 Clause 5.3)
The relative attenuation characteristic of each filter in a filter set shall be measured on the reference level range. The level of the input signals shall be within 1dB of the upper boundary of the linear operating range. A steady sinusoidal signal is applied to the input of the filter set. The levels of input and output signals at appropriate frequencies are measured.
For periodic verification of compliance with the tolerances indicated above for Class 1 and Class 2 filters, the input signal frequencies are the 17 octave or third-octave band normalized frequencies indicated in the "Freq" column in the table above.

Interpretation: The yellow cells are the observed values. The "Attenuation dB" cells are the attenuation values of each filter with the filter's centre frequency attenuation assumed to be zero (i.e. the relative attenuation). The "Ins Loss" are the actual values of attenuation at the filter centre frequencies. Values in the "Difference" cells are left blank if the observed value is less than 20dB above the noise floor.

☑ Checked

16(d). Third Octave Band Filter

SLM, Attenuator & Generator Settings	
Time Weighting	Fast
Frequency Weighting	Z
SLM Range	MID
Set dB Below Full Scale	-3.0
Attenuator dB	0.0
Reference SPL 1kHz	117.0
Output mVrms	712.9
Noise Floor dB	17.2

Ratio	1	2	3	4	5	6	7	8	9	10	Tolerance	
Freq	4kHz	5kHz	6.3kHz	8kHz	10kHz	12.5kHz	16kHz	20kHz	25kHz	31.5kHz		
0.18	29.9	22.1	33.4	38.3	33.3	39.2	36.7	31.7				
0.33	38.9	41.0	39.2	40.9	41.9	41.5	42.2	39.6				
0.53	38.0	36.2	39.8	38.1	36.8	38.2	38.9	40.7				
0.77	54.5	60.5	73.8	54.5	60.5	73.8	54.5	55.4				
0.89	114.5	114.4	114.5	114.5	114.3	114.5	114.5	114.4				
0.92	116.6	116.6	116.5	116.6	116.5	116.6	116.7	116.6				
0.95	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0				
0.97	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0				
1.00	**117.0**	**117.0**	**117.0**	**117.0**	**117.0**	**117.0**	**117.0**	**117.0**				
1.03	117.0	117.0	117.0	117.0	117.0	117.0	117.0	117.0				
1.06	116.9	116.9	117.0	116.9	116.9	117.0	117.0	117.0				
1.09	116.2	116.3	116.3	116.2	116.3	116.3	116.2	116.3				
1.12	113.5	113.5	113.4	113.5	113.5	113.4	113.5	113.5				
1.30	42.8	65.0	47.0	42.5	65.0	47.2	42.4	35.8				
1.89	35.7	18.3	25.8	35.7	39.2	35.6	28.1	35.7				
3.07	18.5	27.8	19.3	19.5	30.0	20.4	20.5	23.2				
5.43	16.8	16.7	28.1	16.5	28.2	21.8	16.4	19.8			Class 1	Class 2
Attenuation dB	87.1	94.9	83.6	78.7	83.7	77.8	80.3	85.3			+70/inf	+60/inf
	78.1	76.0	77.8	76.1	75.1	75.5	74.8	77.4			+61/inf	+55/inf
	79.0	80.8	77.2	78.9	80.2	78.8	78.1	76.3			+42/inf	+41/inf
	62.5	56.5	43.2	62.5	56.5	43.2	62.5	61.6			+17.5/inf	+16.5/inf
	2.5	2.6	2.5	2.5	2.7	2.5	2.5	2.6			+2/+5	+1.6/+5.5
	0.4	0.4	0.5	0.4	0.5	0.4	0.3	0.4			-.3/+1.3	-.5/+1.6
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			-.3/+.6	-.5/+.8
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			-.3/+.4	-.5/+.6
	0.0	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**			-.3/+.3	-.5/+.5
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			-.3/+.4	-.5/+.6
	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0			-.3/+.6	-.5/+.8
	0.8	0.7	0.7	0.8	0.7	0.7	0.8	0.7			-.3/+1.3	-.5/+1.6
	3.5	3.5	3.6	3.5	3.5	3.6	3.5	3.5			+2/+5	+1.6/+5.5
	74.2	52.0	70.0	74.5	52.0	69.8	74.6	81.2			+17.5/inf	+16.5/inf
	81.3	98.7	91.2	81.3	77.8	81.4	88.9	81.3			+42/inf	+41/inf
	98.5	89.2	97.7	97.5	87.0	96.6	96.5	93.8			+61/inf	+55/inf
	100.2	100.3	88.9	100.5	88.8	95.2	100.6	97.2			+70/inf	+60/inf

Ins Loss	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Conforming	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A

Uncert (+/-) dB	0.09

Description of Test

16(d) Third Octave Filter (AS 4476 Clause 5.3)
The relative attenuation characteristic of each filter in a filter set shall be measured on the reference level range. The level of the input signals shall be within 1dB of the upper boundary of the linear operating range. A steady sinusoidal signal is applied to the input of the filter set. The levels of input and output signals at appropriate frequencies are measured.
For periodic verification of compliance with the tolerances indicated above for Class 1 and Class 2 filters, the input signal frequencies are the 17 octave or third-octave band normalized frequencies indicated in the "Freq" column in the table above.

Interpretation: The yellow cells are the observed values. The "Attenuation dB" cells are the attenuation values of each filter with the filter's centre frequency attenuation assumed to be zero (i.e. the relative attenuation). The "Ins Loss" are the actual values of attenuation at the filter centre frequencies. Values in the "Difference" cells are left blank if the observed value is less than 20dB above the noise floor.

☑ Checked